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Spare that snake!



Citizens' Bulletin

May 1982
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Cover Photo: Copperhead, Leonard Lee Rue III

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Former Park and Forest chief dies

Donald C. Mathews, who served as director of the Connecticut State Park and Forest Commission for nearly a quarter of a century, died March 21 in Pompano Beach, Florida. He was 76.

Mathews left the Woodruff Seed Company of New Haven in 1947 to become the State's director of parks and forests. During his tenure, the Commission went through a period of major acquisition and development. In 1947 the State had about 50 State Parks. In 1971, when Mathews retired, the number had grown to 91 State Parks and 19 State Forests.

Closest to Mathew's heart among the activities during his career with the Park and Forest Commission was the development of a section of Harkness Memorial State Park in Waterford and the establishment of programs there to specially serve the handicapped of the State. ■

Girl Scouts give "Gift of Water"

In March, representatives from the six Girl Scout Councils of Connecticut gathered at a special ceremony with DEP Commissioner Stanley J. Pac and Deputy Commissioner John Anderson to celebrate the Girl Scouts 70th birthday.

As part of their 70th anniversary celebrations the Girl Scouts are focusing on the United

"The Connecticut Department of Environmental Protection is an equal opportunity agency that provides services, facilities and employment opportunities without regard to race, color, religion, age, sex, physical handicap, national origin, ancestry, marital status or political beliefs."

Nations' International Water Decade and have pledged themselves to cleaning up, conserving, and protecting Connecticut's waters.

The project began with a special conference in January, sponsored jointly with the Institute of Water Resources at the University of Connecticut. At the March ceremony with Pac and Anderson, representatives of the various Girl Scout Councils announced some of the "gifts of action," involving the State's waters, that they will be presenting to their local communities.

Among the projects planned in various areas are clean-ups of ponds, brooks, and river banks; water conservation efforts; water safety awareness programs, and installation of waterfowl boxes.

State Representatives Pauline R. Kezer, from the 22nd District and Mae S. Schmidle, from the 106th District, presented each Girl Scout Council with an official citation from the General Assembly for the Girl Scouts' participation in the "Gift of Water" project. The ceremony at the State Office Building also included a 70th birthday cake. ■



Sssssnakes alive!

By Audrey Handelman, Environmental Intern

● "Rattlesnakes always rattle before striking."

"If the fangs of venomous snakes are removed, the snakes are rendered harmless."

"Cooperheads and rattlesnakes emit an odor which resembles the odor of cucumbers."

"Snakes are slimy."

"Only venomous snakes have broad, triangular-shaped heads."

The above are some commonly held but false beliefs about

poisonous snakes. Rattlesnakes, if stepped on while sleeping, will often strike first and rattle as they retreat; venomous snakes frequently shed their fangs in the wild and thus are equipped with a new set ready to grow in if existing ones are removed; copperheads and rattlesnakes will emit a fine liquid spray from scent glands at the base of the tail, but this spray smells nothing like cucumbers; snakes are often smooth and velvety; many non-venomous snakes have broad, triangular heads, just as many venomous snakes may have long, slender heads.

There are many more "tall tales" told about snakes. Unfortunately, all are based on a mistrust and suspicion of these reptiles which arises from a lack of accurate information about them. The unreasonable fear of reptiles and amphibians, known as herpetophobia, is directly related to misconceptions about the biology, habitat, and behavior of these animals.

There are 14 species of snakes found in Connecticut; of these, only two, the timber rattlesnake and the northern copperhead, are poisonous. Richard Petersen, a noted Connecticut herpetologist, warns that the timber rattlesnake, while not in immediate danger, must be treated with greater respect and understanding if it is to remain a part of Connecticut's wildlife. Human activity has so reduced its habitat that it is extinct in Maine and endangered in Rhode Island. What follows is intended to acquaint the layman with Connecticut's two venomous snake species and thus to allay unreasonable fears of them as well as to help protect these snakes and other harmless species from needless deaths due to misidentification and to aid outdoorsmen in their recognition of and ability to cope with encounters with these two species.

Timber rattlesnake

(*Crotalus horridus horridus*)

Color and Pattern

This species, unlike most rattlesnakes, goes through two distinct color phases. In the first phase, its head will be light or dark yellow, very broad and unmarked, the iris of the eye will be yellow, the pupil black and vertically elliptical. The ground color of the body will be light or bright yellow, with dark-brown or black chevron-shaped cross bands. A



thin, striking yellow border surrounds each chevron.

In the dark or black phase, the head will be black or dark brown, the iris of the eye dark grey, the pupil black and vertically elliptical. The ground color of the body will be dark brown or greyish black, and chevrons will be bordered with thin yellow margins. The tail, in both cases, is dark brown or black and unmarked, with a segmented rattle on the tip.

Habitat and distribution

The timber rattlesnake prefers remote, mountainous terrain characterized by steep ledges and rock slides. It is believed that the snakes hibernate in deep underground caverns reached by fissures and crevices in the ledges. The snakes prefer cavern entrances with southern, southeastern, and southwestern exposures. Many kinds of deciduous trees, some coniferous stands, mountain laurel, and blueberry characteristically grow in the sort of areas timber rattlesnakes prefer for their dens; a supply of water is always nearby.

The timber rattlesnake's distribution in Connecticut is spotty and intermittent. The snake is absent from many towns and even from entire counties. Its home range-- the distance it ventures from its den -- is variable, but it is thought that the snake may cover a distance of a mile or two during its migration from the den in the spring and its return to it in the autumn. As long as environmental conditions remain satisfactory, the snake will probably travel no more than a couple of miles. Like any animal, however, it may be forced to venture further if conditions in its home range become unfavorable.

Northern copperhead

(Ancistrodon contortrix mokasen)

Color and Pattern

The head of this species is coppery, similar in color to an old copper coin. A very thin line on the sides of the face separates the richer copper



Notice the vertically elliptical pupils in the eyes of the copperhead (below) and the timber rattler (above). Eastern garter snake (on page 3), like other non-poisonous snakes of this region, has round pupil.



color of the top of the head from the lighter color of the lips. The iris of the eye is pale gold, the pupil dark and vertically elliptical. A series of dark-brown to reddish hourglass-shaped marks band the body. Background color ranges from beige to tan, and body markings are continuous over the entire length of the body, including the tail.

Habitat and distribution

The copperhead is fond of moist, damp areas, with many dens being found on the fringes of swamps, reservoirs, rivers, and streams. It prefers trap-rock (basalt) ledges with rock slides below. As with the rattlesnake, cavities throughout the slide or in the heavy ledges above provide the copperhead with adequate hibernation space. This species is also likely to choose southern, southeastern, or southwestern exposures.

The majority of towns containing copperhead colonies are close to one another, as are those towns with rattlesnake populations, although within Connecticut copperheads occupy a larger area than do rattlesnakes. In addition, it seems that the copperhead is more plentiful within its range, as well as being more widely distributed throughout the state.

Classification & General characteristics

Both the timber rattlesnake and the northern copperhead belong to the family of snakes known as "pit vipers," so named because of the loreal pits located on each side of the face between the eye and nostril. These pits contain nerve endings sensitive to radiant heat and help the snake detect warm-blooded prey in darkness. Two well developed venom-conducting fangs are located in front of the mouth; these are shed periodically and replaced. Each fang is connected to a venom gland on either side of the face. Venom is pumped through the fang channel into the victim by muscular action. It should be stressed that the primary purpose of these species' venom

is to immobilize their prey -- usually small rodents and birds -- and to aid in digestion. Neither snake is vindictive; neither will pursue or attack humans if there is room to retreat.

How to avoid snakebite

Bites by poisonous snakes in Connecticut are rare. Although there are no accurate annual statistics on envenomation, most authorities believe that the incidence of death is higher each year from bee stings and lightning than from poisonous snakebites. According to Richard Petersen, most people are bitten during the summer while working or playing in their yards, and bites are most common on the foot, lower leg, ankle, hands, and fingers. He suggests taking the following precautionary measures when in areas likely to be inhabited by copperheads or rattlesnakes:

- 1) Wear high leather boots.
- 2) When climbing in a rock slide or up a rock ledge, be especially careful where you put your hands and feet.
- 3) Always examine an area carefully before sitting down.
- 4) Be extra wary around stone walls, brush piles, and rotten logs, as these are common places for snakes to search for food; keep this in mind when camping and collect firewood during the day.
- 5) Never try to capture a venomous snake.
- 6) Never put your fingers under a rock or log to lift or turn it.
- 7) When trying to identify an apparently dead venomous snake, never put your fingers in or near its mouth.

If you are bitten

The effects of snakebite have tended to be exaggerated and misunderstood by the general public. Contrary to folklore, death is not swift and horrible, nor is recovery impossible. In fact, in most cases there is sufficient time to get the

victim to a doctor. This procedure, rather than trying to treat the bite inexpertly, is recommended.

After summoning medical help, there are several steps which should be taken. First, the snake should be located and killed if it was not identified at the time of the bite; a sharp blow on the head or neck should kill the snake. It should then be brought to the hospital. If there is only one person available to help the victim, however, he should not waste time searching for the snake.

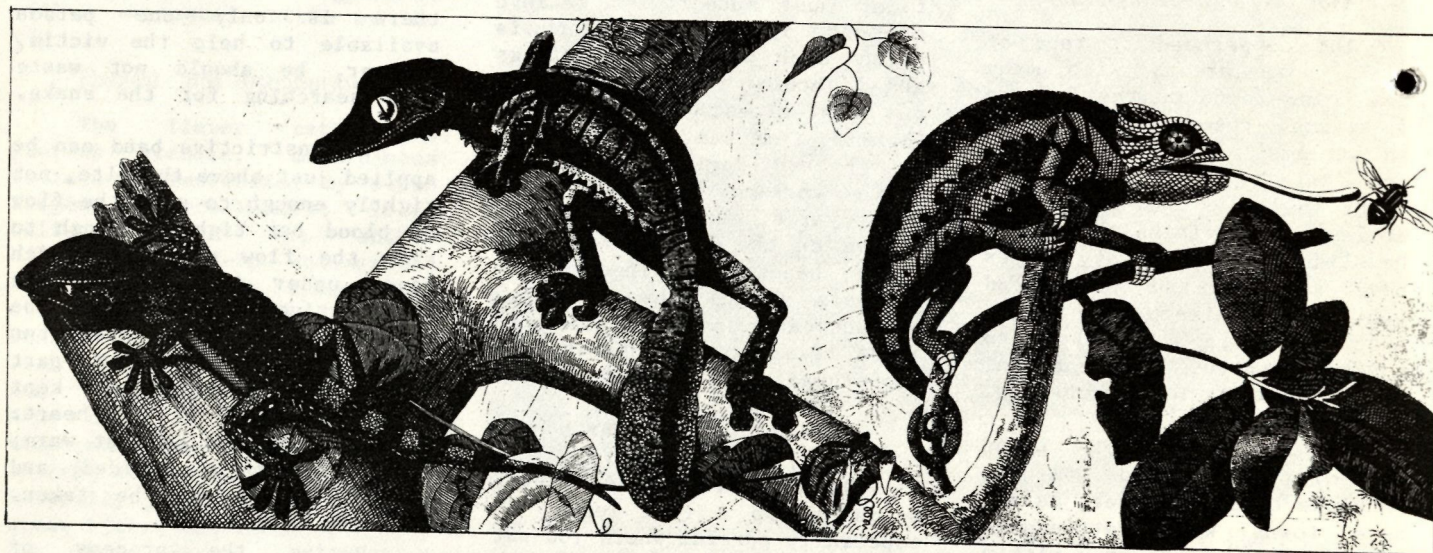
A constrictive band can be applied just above the bite, not tightly enough to stop the flow of blood but tightly enough to slow the flow of venom which moves under the skin. The constrictive band should be released for a minute every ten minutes. The injured part should be immobilized and kept below the level of the heart. The victim should be kept warm; walking should be avoided; and alcohol should not be taken.

During the process of getting the victim to a hospital or doctor, it is important to reassure him that treatment is being carried out. The hospital should be notified, if possible, that a snakebite victim is being brought in.

"Let them live"

"Although men stopped burning witches many years ago, we continue to slay our sinister dragon-snakes," writes Petersen. "We must put 'hoopsnakes,' striped and flat-headed 'adders,' along with many other popular beliefs about snakes into the annals of mythology, where they belong . . . We do not unreasonably fear what we understand. And, as far as fear of snakes is concerned, it is common knowledge among naturalists that man's fear of snakes is only equalled by the snake's fear of man."

Source: Connecticut's Venomous Snakes: Timber Rattlesnake and Northern Copperhead, by Richard C. Petersen. State Geological and Natural History Survey of Connecticut, Bulletin 103, 1970.■



Reptiles get some respect

By Audrey Handelman, Environmental Intern

Herpetology is the branch of zoology which deals with the study of reptiles and amphibians. The word is derived from the Greek noun "herpeto," meaning "a creeping thing."

The Connecticut Herpetological Society was founded in 1968 by herpetologist Richard Petersen because of interest on the part of herpetologists around the state. The Society's purposes are two-fold: the education of its members and the general public and the conservation of all wildlife, herpeto-

fauna in particular. The society's membership has fluctuated between 100 and 140, with some members dropping out for a year or two and then rejoining.

According to Robert Fritsch, a police officer in Wethersfield who has been an active member in the society since its beginning, there are several reasons why people join the society. Some, like himself, are motivated to join out of a deep and abiding interest in herpetology; others

hold advanced degrees in zoology, veterinary medicine, related fields, and are interested on a professional level; still others Fritsch calls the "boa types" -- members whose commitment to the Society is no less than other members' but whose focus tends more toward the animals' novelty as pets than to scientific or technical interests.

Fritsch's own approach is oriented toward conservation. As co-chairman of the society's conservation committee (one of two standing committees -- the

other being the education committee -- essential to the functioning of the society and the accomplishment of its purposes), Fritsch brings to the organization a strong commitment to the conservation and protection of wildlife.

His interest is long-standing. "I can remember being interested in birds of prey and other predatory animals when I was ten or twelve," Fritsch says. "Soon after, I got interested in snakes and other reptiles and amphibians." If he had to attribute his interest in herpetology to a particular influence, Fritsch says it would have to be to Raymond L. Ditmars. Ditmars, although he did not hold a degree in zoology, published numerous books on herpetology, and his works are considered "bible literature" by many herpetologists.

The books are old--1930s and 1940s editions--and are illustrated only with black and white photographs. But the vividness of Ditmars' writing brought the subject alive for Fritsch, who later concentrated on biology in college. He remains an amateur herpetologist, however, having pursued a master's degree in East Asian Studies.

As a member of the Herpetological Society, Fritsch has been able to combine his interest in reptiles and amphibians with his interest in politics. After four and a half years of lobbying along with other environmental groups, the society finally saw an important bill signed into law by Governor O'Neill on May 11, 1981. Public Act 81-103 (An Act Concerning Regulatory Authority Over the Taking of Wildlife) goes into effect October 1, 1981, and is a change that Fritsch and many others feel was long overdue.

"By changing four words," Fritsch explains, "we now have an act which can protect all wildlife."

Section 26-66 of the General Statutes now reads (with previous wording in parentheses--

es): "The commissioner may, after notice and public hearing, issue regulations governing (hunting for) THE TAKING OF all species of (game birds and wild quadrupeds) WILDLIFE, in and in accordance with the provisions of section 26-91 . . ." Fritsch stresses that the new law does not provide "a carte blanche protection for all species. But it's a very important change. The Endangered Species Act operates on a federal level, which is fine, it's a great idea . . . but if a species is plentiful somewhere else in the nation and not in Connecticut, there would be no regulation regarding its taking because it would not appear on the list of endangered species."

Fritsch worries about current trends he sees in worldwide growth of population and development of previously undeveloped areas. While his primary concern is reptiles, he sees the plight of many species of reptiles and amphibians as representative of the problems faced by all wildlife.

"Not everyone is aware of the seriousness of the two major threats to wildlife in the world today," he says. "One threat is habitat destruction -- the reduction of the feeding, breeding, or living space of a species by the development of land or by pollution.

"The other threat is 'collection pressure.' That's exploitation of a species for money, whether it's the pet trade, zoos, or whatever. With the boa constrictor, for example, there's been enormous pressure from the pet trade to pull large numbers of them out of the Amazon. And some zoos don't always have clean records, either. They've been known to pay big bucks for endangered species."

Fritsch, among others, thinks that the captive breeding of species will play an increasingly important role in the future in maintaining a variety of wildlife on the planet.

Despite what might seem to be a pessimistic view, Fritsch

has some encouraging things to say about people's attitudes toward wildlife conservation in general and toward herpetology in particular. A majority of his friends and acquaintances have reacted to his hobby with curiosity. "Most people don't know what herpetology is," he says. "But when I explain, they are usually full of questions and eager to learn. I don't think that kind of open-mindedness was so common 20 years ago; the atmosphere now is a lot healthier. Many people still have phobias about snakes, but they will admit that the phobia might be a result of their not understanding much about the creatures."

Fritsch regularly receives calls about problems with snakes, which are referred to him and several other Herpetological Society members by the DEP, the State Police, the Connecticut Humane Society, and occasionally Hartford Hospital. "I answer about 150 to 200 calls a year," he says, "and when you consider that the season for spotting snakes is only five or six months long, that's a lot of calls."

Some of the calls, such as those from the hospital, deal with identifying snakes which have bitten individuals. Others are less urgent, and Fritsch tries to handle some of the routine problems by phone. There are some cases, however, in which he feels he must travel to the site if it is reasonably close. "There is a public trust operating here which shouldn't be violated. For example, I've gotten a number of calls from the same couple of families in Glastonbury. They've had problems with rattlesnakes. But they have never harmed or killed the snakes, they've always called me first. I'll do my best to get over there if they call."

It is essential, Fritsch feels, to "respond in kind" when citizens show such respect for wildlife, even those species which may be threatening. "Conservation and education," he says, "are what the Herpetological Society is all about." ■

Get acquainted with the ground that you walk on

By Maureen Guck, Student Intern, Trinity College



Knowledge about the soil classification system is helpful in assessing wetlands and for other land use considerations.

While many people wonder about the names of plants and animals they see, few ever wonder about the type of soil upon which they walk. Soil, however, like plants and animals, has a system of classification and nomenclature. Just as plants and animals are divided into the increasingly specific categories of kingdom, phylum, class, order, family, genus, and species, soils too are divided into categories of order, suborder, great group, subgroup, family, and series. (Table I.) This system of classification, developed through a series of approximations, classifies soils according to their physical properties

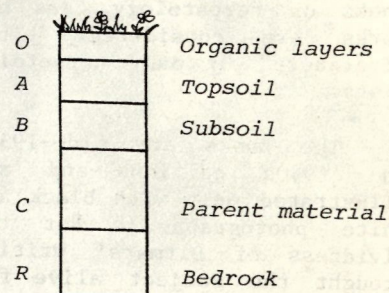
TABLE I.

Categories of the
U.S. Department of
Agriculture's
Comprehensive
Soil Survey System

There are six categories in the system.

Highest Level	Order
(Increasing	Suborder
Specificity)	Great Group
Lowest Level	Subgroup
	Family
	Series

ILLUSTRATION I.



and other diagnostic features such as chemical properties.

The first four levels of classification are differentiated on the basis of the soil layers or horizons. If you were to look at a profile of soil, you might notice distinct layers. These layers are called horizons by soil scientists. There are generally three major classes of soil horizons, not including upper surface horizons consisting of litter and organic material which is usually present. These horizons are designated by the letters A, B, and C, and may be further subdivided by the assignment of numbers and letters, i.e., A₁, B_{w2}, etc. (Illustration 1.)

To facilitate the classification of soils, certain "diagnostic" horizons have been identified. The surface diagnostic horizons, which include the A and may also include all

or part of the B horizon, are called "epipedons." There are six types of epipedons (Table II) and many types of subsurface horizons presently recognized. (See Table III for six major subsurface horizons.) These different types of diagnostic horizons are separated on the basis of physical characteristics such as coloring and amount of organic matter. These various horizons are then used in describing the different orders, suborders, etc. For instance, the soil order Mollisol includes soils having "mollic" epipedons, meaning that these are soils which possess thick, dark-colored, and alkaline upper layers.

TABLE II.

<u>Diagnostic Horizon</u>	<u>Characteristic</u>
<u>Epipedons</u>	
Mollic	Thick, dark colored, high base saturation
Umbric	Same as mollic, but lower base saturation
Ochric	Light in color, low in organic matter
Histic	Very high in organic matter, wet during part of the year
Anthropic	Resembles mollic but has high phosphate content from continuous cultivation and fertilization
Plaggen	Thick horizon created by continuous application of manure

The soil order is the highest and most general category of the system. The names of the ten orders end in sol and each contains a formative element, or descriptive root, which is carried through to the names of the suborder, great group, and subgroup. For example, in the order Inceptisol, "ept" is the formative element carried into the suborder Aquept. (See Table IV). Connecticut soils are predominantly members of the Inceptisol and Entisol orders.

TABLE III.

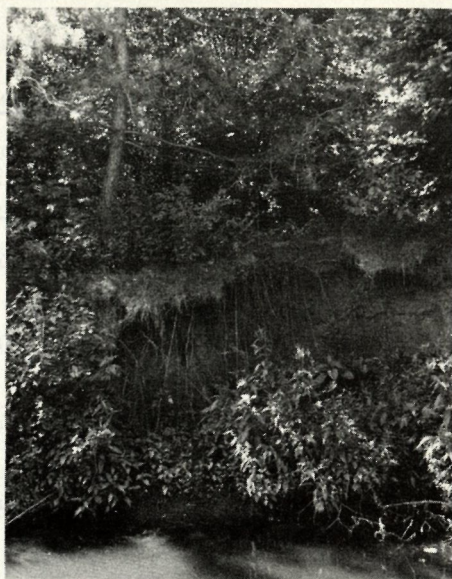
<u>Diagnostic Horizons</u>	<u>Characteristic</u>
<u>Some major subsurface horizons</u>	
Argillic	Accumulation of clay
Agric	Accumulation of clay and organic matter below plow layer
Natric	Argillic horizon high in sodium
Spodic	Accumulation of iron and aluminum oxides and organic matter
Cambic	Changed due to physical and chemical reactions, weakly expressed features
Oxic	Advanced weathering, iron and aluminum oxides, clay

TABLE IV.

<u>Names of Soil Orders and Formative Elements</u>	
<u>Soil Order</u>	<u>Formative Element</u>
Entisol	ent (<u>recent</u>)
Vertisol	ert (<u>invert</u>)
Inceptisol	ept (<u>inception</u>)
Aridisol	id (<u>arid</u>)
Mollisol	oll (<u>mollify</u>)
Spodosol	od (<u>podzol</u>)
Alfisol	alf (<u>pedalfer</u>)
Ultisol	ult (<u>ultimate</u>)
Oxisol	ox (<u>oxide</u>)
Histosol	ist (<u>histology</u>)

The suborder is more specific. The 47 suborders allow for a more extensive description of physical properties and climatic variables which may affect the soil. Names of the suborders consist of two syllables. The first syllable is a formative element which describes some diagnostic feature, the second is the formative element carried down from the soil order (Table V).

The suborders are further separated into the great groups,



Few people wonder about the soils upon which they walk.

which are again defined on the basis of their physical properties with special interest in the particular soil horizons. The names of the great groups consist of the names of the suborders from which they descend, plus a formative element which defines some diagnostic feature. (See Table VI for example, using the Ridgebury series, a wetland soil.) There are over 180 great groups recognized at present. The subgroup represents further specificity. The subgroups are named by attaching an adjective to the name of the great group, thereby indicating the extent to which the characteristics of the great group are expressed.

Families represent soils within a subgroup which have similar properties with respect to specific physical characteristics, such as temperature and texture. Family names consist of adjectives which describe the particular properties of the class, for example, coarse-loamy, mixed, mesic, etc.

The soil series is the last and most specific designation in this soil classification system. The series represents a group of soils developed from the same type of parent material by similar soil forming processes and whose horizons are similar with respect to important characteristics such as arrange-

Table V.
Suborders of Inceptisols

<u>Suborder Formative Element</u>	<u>Order Formative Element</u>	<u>Suborder</u>
and (volcanic)	+ept (Inceptisol)	→ Andepts
aqu (wetness)	+ept (Inceptisol)	→ Aquepts
ochr (light-colored)	+ept (Inceptisol)	→ Ochrepts
plag (plaggen, manure added)	+ept (Inceptisol)	→ Plaggepts
trop (continually warm)	+ept (Inceptisol)	→ Tropepts
umbr (dark- colored)	+ept (Inceptisol)	→ Umbrepts

TABLE VI.

Classification of Ridgebury Soil

Order-----	Inceptisols
Suborder-----	Aquepts
Great Group-----	Fragiaquepts
Subgroup-----	Aeric Fragiaquepts
Family-----	Coarse-loamy, mixed, mesic
Series-----	Ridgebury

ment, thickness, texture, color, etc. The name of the soil series is usually the name of a city, county, or town where the series was first recognized.

Some knowledge of the soil classification system can help you to better understand and more effectively use the information found in the county soil surveys. County soil surveys, valuable for land use planning and natural resources assess-

ment as well as water resources, wetlands, and engineering studies, are available from: USDA Soil Conservation Service, Mansfield Professional Park, Route 44A, Storrs, CT 06268 (429-9361) or from county Soil and Water Conservation District offices or DEP's Natural Resources Center, Room 555, State Office Building, 165 Capitol Avenue, Hartford, CT 06115 (566-3540).

CAM Program to be reviewed

By Diane Giampa,
Public Participation Coordinator

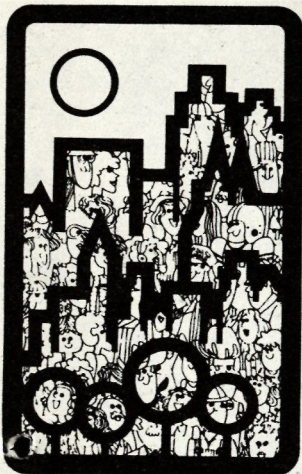
Connecticut's Coastal Area Management Program will undergo both a federal and a State review in the upcoming weeks. This month, the federal Office of

Coastal Zone Management (OCZM) will conduct its second "312 Review" of Connecticut's CAM Program. Several weeks after that, the Connecticut Legislative Program Review and Investigations Committee will assess CAM's performance in keeping with the requirements of the so-called "Sunset Review."

The results of these two reviews will affect the future of Connecticut's coastal program. The federal "312 Review" is a prerequisite to awarding an additional year's implementation grant to a state's CAM program, while the "Sunset Review" examines programs to determine if they should be modified or even terminated if they do not significantly benefit public health, safety, or welfare. Both the federal OCZM and the State Program Review Committee are interested in public opinions and comment. To that end, several public hearings will be scheduled within the next few weeks. The dates and locations will be announced soon.

The "312 Review" takes its name from Section 312 of the Coastal Zone Management Act. Section 312 requires a "continuing review," or a yearly performance assessment of all approved coastal zone management programs. When the representatives from the federal OCZM arrive in the next week or two, they will be looking at many different aspects of the Connecticut CAM Program. Some of these areas are CAM's leadership role in coastal issues and the program's progress in protecting natural resources such as wetlands, beaches, and estuaries. The OCZM will also evaluate how well CAM has discouraged improper coastal development and simplified procedures to guarantee speedier governmental decision-making in coastal matters. The findings of the "312 Review" will be published in the Federal Register, and copies will be sent to anyone who requests them. Last year, Connecticut's CAM Program received good grades in its first "312 Review." Overall, the OCZM concluded that the Connecticut program had enjoyed a "successful first year," and that it had provided the participating towns with "timely and competent technical assistance" in developing and maintaining their own coastal programs. CAM looks forward to a similarly positive assessment of its second year's performance.

During the summer, Connecticut's CAM program will undergo its first so-called "Sunset Review." "Sunset" is a legislative provision which automatically terminates programs and activi-



By Leslie Bieber,
Citizens' Participation Coordinator

For Your Information

EPA accepts waste plan

On March 4, 1982, U.S. Environmental Protection Agency Administrator Ann Gorsuch formally approved Connecticut's Solid Waste Management Plan. This action made Connecticut the first state in New England, and one of the first in the country, to have its plan accepted.

The plan, which was prepared by the Solid Waste Management Unit of the DEP, deals with solving the state's worsening solid waste disposal crisis. Charles Kurker, Director of Solid Waste Management, explained that EPA had established guidelines for the development and implementation of state plans. Approval of the plan indicates that it has met the requirements set forth in the federal Resource Conservation and Recovery Act of 1976, which provides for the identification of the state, regional, and local responsibilities for solid waste management; the encouragement of resource conservation and recovery; and the development and application of state controls to provide for environmentally sound solid waste disposal practices.

Connecticut has long counted on regional resource recovery to handle the stream of municipal solid waste. The new plan defines the current problem (not enough suitable landfill space) and then states the goals that must be reached to solve the problem. These goals, reducing the volume of waste needing land

disposal and assuring the availability of landfill space, are discussed in detail in the document. The strategy planned by State officials in order to attain the goals is still a system of regional resource recovery facilities augmented by large, well-run landfills; the landfills would receive ash residue from the plants and some municipal waste. The plan will continue to be updated as new options and/or technologies become available.

Copies of the Solid Waste Management Plan are available to interested citizens. Contact Charles Kurker, Director, Solid Waste Management Unit, 165 Capitol Avenue, Hartford, CT 06115, or call (203) 566-5847 if you would like more information on this subject. ■

Nature Conservancy acquires pond

On April 1, the Connecticut Chapter of the Nature Conservancy acquired a 290-acre parcel of land on the Connecticut River. This purchase was greeted with a combination of joy and relief by citizens interested in the conservation and preservation of natural areas because it contains Chapman's Pond, which supports several rare flora and over 250 species of wildlife. Ken Olson, Executive Director of the Chapter, calls the pond "one of the most endangered critical habitats in Connecticut." ■

Many people and agencies played a part in assuring the purchase. Governor William O'Neill, Senators Lowell Weicker and Christopher Dodd, and Representatives Stewart McKinney and Sam Gejdenson all lent their support to the project. Their efforts helped the Eastern Connecticut Resource Conservation and Development Project funnel a \$160,000 grant from the U.S. Soil Conservation Service to the Conservancy. "Without their aid," said Olson, "the chances of saving this biologically important area would have been vastly diminished. And the Soil Conservation Service deserves excellent marks for recognizing the importance of the project and giving it top priority. This project has been one of remarkable alliances, in this case among politicians, bureaucrats, and non-profits."

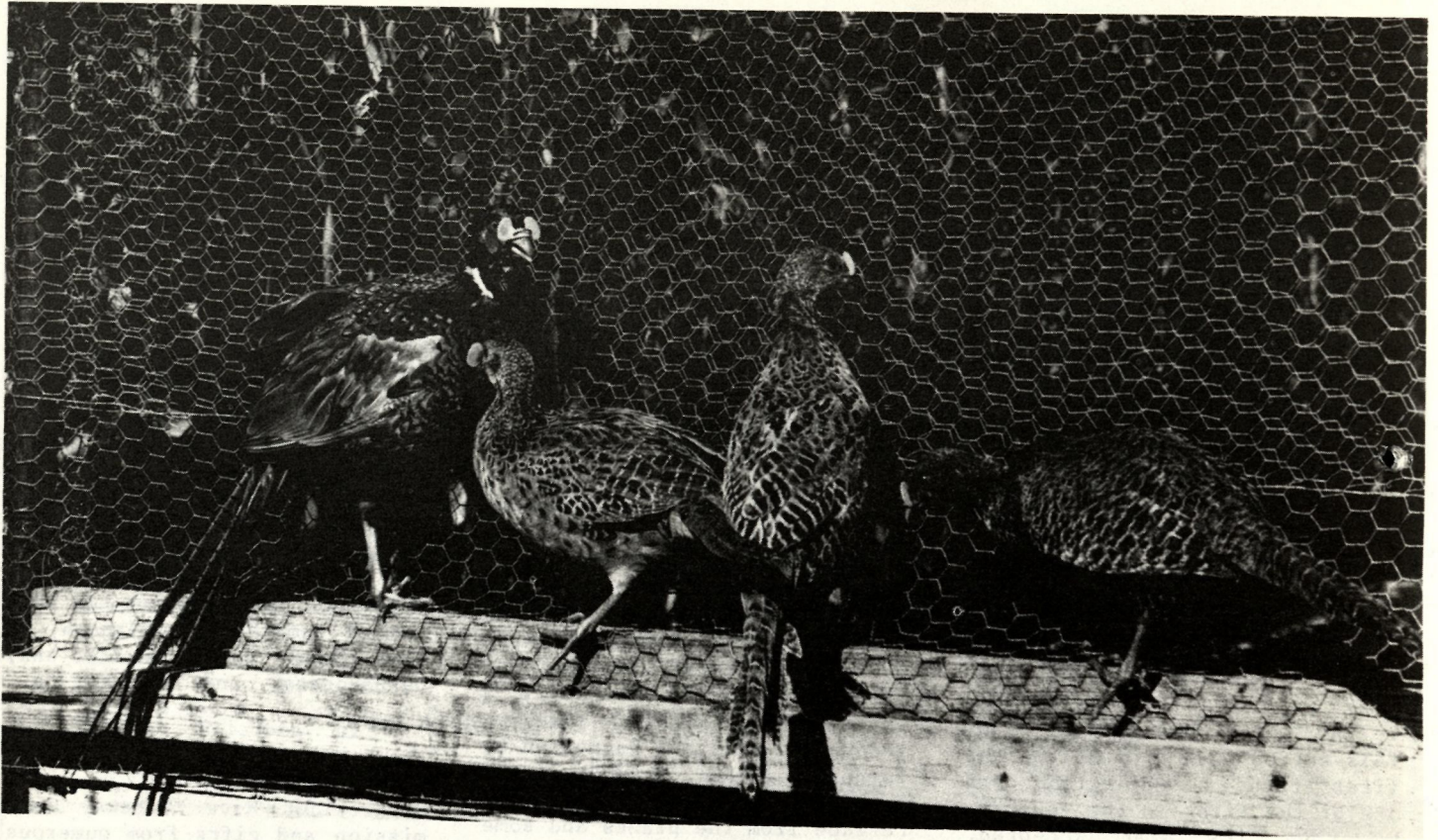
In addition to the SCS grant, the Conservancy received a pledge of \$300,000 from the Connecticut River Gateway Commission and gifts from numerous individuals. Total cost of the purchase was \$700,000, of which the Conservancy had raised about 85 percent. They are still looking for benefactors to make up the difference and "put them over the top."

The Nature Conservancy is a national non-profit organization of 130,000 members, with 5,000 in Connecticut. The group has preserved two million acres in the U.S., including 12,000 acres in Connecticut, where the Conservancy was started. Its lands constitute the largest such preserve system in the U.S. and probably in the world, Olson said. ■

Water Supply Bibliography

DEP's Natural Resources Center has recently published "An Annotated Bibliography for Water Supply in Connecticut" as a part of a series of water resources related bibliographies for the Long-Range Water Resources Management Planning Program.

Interested persons may obtain copies by sending \$1.00 plus 7.5 percent sales tax to DEP Publication and Map Sales, Room 555, State Office Building, Hartford, CT 06115. ■



Pheasants . . .

number one most sought-after game in State

By Peter Bogue, Supervisor, Wildlife Recreation/Management

It's that time of year again when Connecticut's gamebird breeders start gathering and incubating pheasant eggs in anticipation of the upcoming season. This is the first step in a twenty or so week venture to produce that big ringneck every bird hunter dreams of. To a handful of commercial growers located in our State, raising

pheasants has become a way of life or at least a family tradition. To some breeders, it is a full-time business; to others, it is merely a hobby or a part-time income. But whatever the case, it means producing a commodity which is in great demand in Connecticut and throughout the country. The demand stems from various out-

lets including stocking programs, field trials, dog training, gamebird breeding, and even that mouth watering "pheasant under glass." Other gamebirds in demand include the bobwhite quail, chuckar partridge and mallard duck.

Unfortunately, like many other business ventures, com-

petition, rising production costs, quality control, and other factors have forced many small operators out and have prevented others from even starting in the business. At one time, Connecticut was home to dozens of commercial pheasant growers, but today only a handful remain.

The DEP's Wildlife Unit issues approximately 700 game breeder's licenses each year. This licensing is required for everyone from the backyard pheasant fancier to commercial operators producing in excess of 15,000 gamebirds annually. License applications, applicable laws, and a listing of gamebird breeders raising for sale are available from DEP's Wildlife Unit. (Please note that a license is required of anyone raising more than one gamebird.)

Connecticut's pheasant hunting programs are probably the primary market place for most gamebirds, especially pheasants produced within the State. Programs include those administered by the State of Connecticut or by private sportsmen's clubs located throughout the area. For an example, last season the DEP purchased 32,237 adult pheasants from Connecticut breeders for release on lands open to public hunting.

According to the results obtained from a 1976 survey conducted by the DEP Wildlife Unit, pheasants were the number one most sought-after game for Connecticut's sportsmen. A survey directed to Connecticut's pheasant hunters was conducted by the DEP in 1980. Questionnaires were attached to all 1980 hunting licenses, and at the time of purchase sportsmen were asked to complete the survey and mail it to DEP. The information gathered from this particular survey reflected the experiences and expenditures of those sportsmen participating in Connecticut's 1979 bird season. Questions on the survey asked for information pertaining to the expenditures, number of times hunting, game harvest, types of lands utilized, and amount of fees willing to

further expend on Connecticut's pheasant program.

Approximately 11,000 survey responses were returned to the Wildlife Unit during the survey period. Of those surveys returned, approximately 9,000 were identified as pheasant hunters. Please note that conclusions reflect those surveyed and not the total pheasant hunting fraternity.

According to the response, sportsmen conducted their pheasant hunting during that year on State-controlled lands 65 percent of the time. This total includes trips to State-owned, State-leased and permit-required areas. The remaining time was spent hunting in other areas not under the direct control of the Department.

The amount of bird hunting effort put forth during the season ranged from one day to more than 13 days afield. Thirteen percent of those surveyed spent an average of one to two days afield. This category probably includes those individuals who hunt only on the opening day of the season or during the opening week. Twenty-five percent spent between three and five days hunting, while 34 percent averaged six to 12 days. The remaining 28 percent represented the avid bird hunters who spent in excess of 13 days afield.

In addition, sportsmen were asked if they hunted on the opening day of the season. Sixty-three percent of those surveyed responded "yes" to this question.

The number of birds harvested was directly related to the amount of effort expended along with the type of area utilized. Forty-nine percent of those hunting State-owned or State-leased lands averaged one bird or less during the season. Twenty-eight percent harvested between two and four birds while 11 percent took home up to seven birds. Eight or more birds were taken by the remaining 12 percent of those utilizing State lands. Individuals hunting on permit-required areas and lands under Cooperative Stocking

Programs experienced slightly higher seasonal bags.

The average bird hunter surveyed spent \$132.81 during 1979 for equipment, fees, field trials, and other related items. This represents a contribution to the State's economy of almost \$1.2 million. The total expenditure by all pheasant hunters far exceeds this amount. Eighty-two percent of those surveyed were also willing to contribute additional money to supplement the State's pheasant program. Of those willing to expend additional fees, 26 percent were in the one to three dollar category, 25 percent responded to the four to nine dollar category while 31 percent would contribute in excess of nine dollars. The additional fee acceptable was directly related to the amount of time spent afield and the number of birds harvested during the season. The more avid hunters responded positively to the higher fee categories while the casual hunters chose the lower.

Bird hunters also rated flight as the most important quality a game bird should possess. Weight and appearance were rated as second and third qualities preferred.

Eighty-five percent of the survey responses were from sportsmen purchasing combination hunting, trapping, and fishing licenses. Twelve percent were holders of hunting only licenses, and the remaining responses included those possessing military, over 65, or non-resident license types.

The information gathered through this survey and similar ones has aided DEP personnel in evaluating existing programs and in developing new approaches to maximize the recreational opportunities available to Connecticut sportsmen.

Connecticut's DEP and its predecessor agencies have been actively involved with pheasants and pheasant stocking for over 70 years. Pheasant hunting has become a valued form of outdoor recreation and hopefully will continue to be in the years to come. ■

State's lifeguards

keep a sharp lookout at 22 waterfronts

By Audrey Handelman, Environmental Intern

Whether spending a week or two at a nearby campsite, staking claim to a patch of sand from dawn to dusk, or merely dropping by for the afternoon, many Connecticut residents enjoy the seaside.

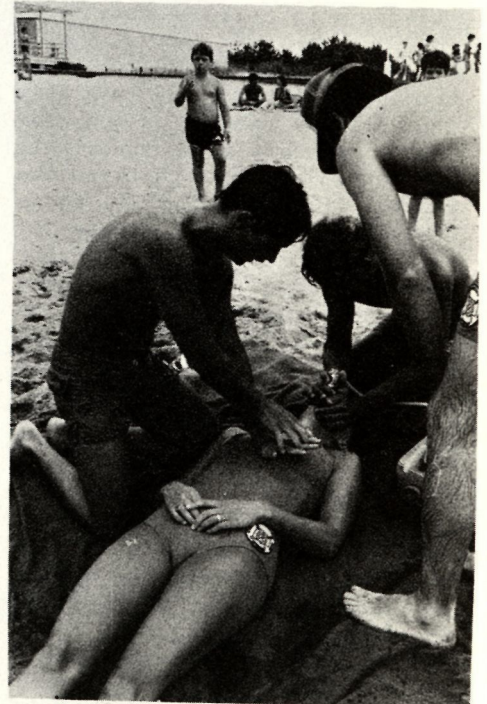
On a busy weekend in the summer, over 20,000 people may carpet the two mile strip of beach at Hammonasset Beach State Park with blankets and towels, to bake in the sun and cool off in the ocean. Charged with the safety of the sunbathers and swimmers at Hammonasset is a crew of 30 State lifeguards, who keep silent vigils atop their lifeguard stands. "The hardest part is remaining alert," says Thomas Truscinski, the man in charge of the State lifeguard

program, which includes about 160 guards at 22 waterfronts, both inland and shoreline, around the State.

"Actually, Hammonasset and Rocky Neck are easier places to guard than some inland areas," he says. "People seem to be more careful at the ocean. The water looks more threatening there; if a little kid wanders up to the waves, he'll probably be frightened and will stay away."

All the guards, whether stationed at inland areas or on the ocean, are well trained and personally tested by Truscinski three times during the summer season: once to qualify for

their jobs, which usually begin about the second week of June; once in mid-season; and again at the season's end near the end of August, which helps determine



State lifeguard supervisor Thomas Truscinski evaluates resuscitation technique during annual competition.

whether they will return as guards the following summer.

"We don't insist on Red Cross certification," Truscinski explains, "because that certification lasts for three years. In three years, it's easy to get out of shape, to forget." Instead, to become a State lifeguard, applicants must pass a rigorous test of their knowl-



Lifeguards simulate a water rescue during one event of the State's annual lifeguard meet. It is held each year in August; the public is invited.

edge of rescue and resuscitation procedures, C.P.R., and a test of endurance based on a timed 100-yard swim. The initial test is offered on several dates in the spring, and applicants may repeat the test.

Fifty to 66 percent of those who take the tests usually pass, Truscinski says. Greatest emphasis is put on the timed 100-yard swim. Truscinski thinks an applicant who is a strong swimmer can probably shape up his or her lifesaving skills in several days of intensive effort. But if your swimming is not "up to speed," a few weeks or even months probably won't help. At the beginning of the season new guards must do 100 yards in 1 minute, 33 seconds. At the end of summer, when Truscinski tests guards who want to return the following summer, cutoff speed is 1.25. "And that's after working out

were no drownings last season in any State-lifeguarded swimming areas. Truscinski figures that each summer there are also about 15 "pickup" rescues of small children that don't make the statistics -- lifeguards, he says, tend not to write these up as rescues.

Not surprisingly, according to Truscinski, many adult drownings or near-drownings--he estimates close to 75 percent--occur when the victim is intoxicated. The other major problem is that parents often don't watch their children closely enough. "You take a three or four year old and move him six blankets away from his parents on a busy weekend," he says, "and the youngster is lost. When a parent reports a missing child, or if an adult is reported missing, we have to decide whether to do a land-only search or a land-and-water search."

a lot of morbidly curious onlookers."

In addition to their safety-related duties, lifeguards at Hammonasset regularly walk the beach equipped with large plastic bags, picking up refuse. Mondays are especially bountiful for picking trash. "Each person may only produce a small amount. But multiply that by 20,000 and you've got a lot of litter," Truscinski says.

Beach Director Brian Kennedy is in charge of the lifeguard crew at Hammonasset. He supervises two captains who are responsible for crews of 15 guards each, with each crew divided into three squads. Guards work two shifts to cover beach areas continuously from 9 a.m. to 7 p.m.; when not on duty or cleaning up, they may be practicing rescues or swimming, which they do every day.



Plastic bag in hand, one of Hammonasset's guards gives demonstration of non-competitive litter pickup technique.

every day all summer," he says. "It takes an awful lot of work to shave off a few more seconds."

Hammonasset, as the largest beach in the State, gets its share of problems. Major emergencies are relatively few, however. Last summer, around the State, lifeguards made 50 water rescues -- 10 of these occurred at Hammonasset. There

If there is an emergency at Hammonasset, Truscinski says, the victim may be brought to one of the three nurse's stations on the beach. If the situation is serious enough to require an ambulance, a beach patrolman meets the rescue vehicle at the park entrance to guide it to the scene of the accident. "Sirens are never used inside the park boundaries--it's sure to attract

The Parks and Recreation Office attempts to fill lifeguard positions with commuters, but dormitory housing is provided free at nine of the parks. For those taking advantage of the dormitories, rules are strict, for good reasons. A guard's job, if done well, is physically and sometimes mentally and emotionally demanding. The dormitory, Truscinski feels, should be a place for rest.

Kennedy's job as beach manager and Truscinski's as lifeguard supervisor are seasonal. Truscinski teaches American history at New Britain High School during the year. He started out as a lifeguard in 1965, and worked his way up to supervisor in 1970. A major part of his job as State Lifeguard Examiner is to maintain uniform standards and equipment at all State beaches. However, he says, "I really do the job because I thoroughly enjoy the work."

If you would enjoy lifeguard work, it may not be too late to apply for this summer. While scheduled pool testing for lifeguard candidates was held in March and April, Truscinski

Wood ducks

make comeback with the help of hundreds of nesting boxes

By Deborah A. Fuller

The wood duck is often called the most beautiful of North American waterfowl species. Anyone who has seen these birds would find it hard to disagree. The males are a showy combination of iridescent reds, greens, and blues. The females are a subtle blend of gray-browns with a striking white eye ring. "Woodies" are one of the most common summer ducks in Connecticut. They frequent inland swamps, marshes, and slow moving streams where flooded shrubs and trees provide good habitat for nesting and the rearing of young.

Wood ducks begin arriving in Connecticut in mid-March. Attractive habitat has a mixture of water, shrubs, and emergent plants that provide food and cover. The area must also contain nesting sites. Unlike most waterfowl, wood ducks nest in cavities in limbs and tree trunks. They cannot excavate or enlarge cavities, and so they must find existing ones of suitable size and location.

The female and her mate usually return to the area where she was hatched or reared young the previous year. She may even use the same nest site. Once nesting begins an average of 12 eggs are laid at the rate of one per day. The female removes

down breast feathers which she uses to cover the clutch of eggs. Incubation lasts around 30 days and is performed solely by the hen.

During this time she leaves the nest twice a day to feed and rest. When the eggs have hatched the hen leaves the nest and calls to the ducklings. One by one the ducklings climb up the inside of the cavity to the entrance hole. Then they leap down to join the female. If the cavity is located over water the hen quickly leads the group to the safety of plant cover. If the box is located on land, the ducklings follow their mother on

an often hazardous trek to the nearest water.

The young stay near the pond all summer. By fall they are capable of flight. In mid-October the juveniles and adults begin their winter migration southward. It has been estimated that 8,000 wood ducks breed in Connecticut each year (Bellrose 1976).

Wood ducks were not always so abundant. In the early 1900s many people believed that woodies were on the verge of extinction. They had been very abundant in North America up until the late 1800s when overharvesting caused the population to decline. Market hunting, shooting of birds during the nesting season, lengthy hunting seasons, and no restriction on the take all contributed to overharvesting. In 1918, with the passage of the Federal Migratory Bird Treaty Act, the wood duck was given full protection from hunting.

Habitat loss and destruction occurring at the same time as overharvesting served to aggravate an already bad situation. The intensive land clearing and forestry management at the beginning of the century destroyed many nesting cavities. The shortage of nest sites was a situation that didn't improve rapidly. In the 1950s several states undertook to alleviate this problem by erecting nest boxes. Woodies adapt rapidly to



Leonard Lee Rue III photo

using nest boxes as long as the boxes provide all the nesting requirements that natural cavities provide. In many ways boxes can be better than natural cavities, offering more protection against the weather and predators. Boxes can also be located close to or over water which reduces the distance newly hatched ducklings have to travel to reach water.

By 1942 wood duck numbers were large enough to support regulated hunting in some states. Their numbers have continued to increase, and since the 1960s the wood duck has been



Irene Vandermolen photo

enough for him. Metal plates attached to the face of the box prevent this. Placing boxes over water not only reduces danger for newly hatched ducklings but also helps to discourage squirrel predation. The inside of the box must be rough enough so ducklings can climb to the entrance hole when leaving.

The Connecticut Department of Environmental Protection began its wood duck nesting box program in 1952 with 53 boxes. As of 1980 there are approxi-

mately 1,000 nest boxes maintained by the DEP. Each winter, when ponds are frozen, Conservation Officers check each box to see if it has been used by woodies. They also make sure boxes are ready for the ducks when they arrive in the spring by clearing them and making any necessary repairs. At least one-half of these boxes are used by wood ducks each year. Other wildlife, such as swallows, starlings, mice, squirrels, owls, and even an occasional kestrel also use these boxes.

Conservation Officer Robert Muldoon and the late Milan J. Bull prepared to set out a wood duck nesting box.

second or third ranked bird in hunter bags in the Eastern United States.

There have been many studies to determine how to build the best wood duck box. One major concern is how to prevent or reduce predation. In our area raccoons are the biggest offenders. They enter boxes to eat the eggs and often kill incubating females. A small elliptical entrance hole in nest boxes prevents raccoons from entering the box. A persistent raccoon, however, will chew on the box until the hole is big



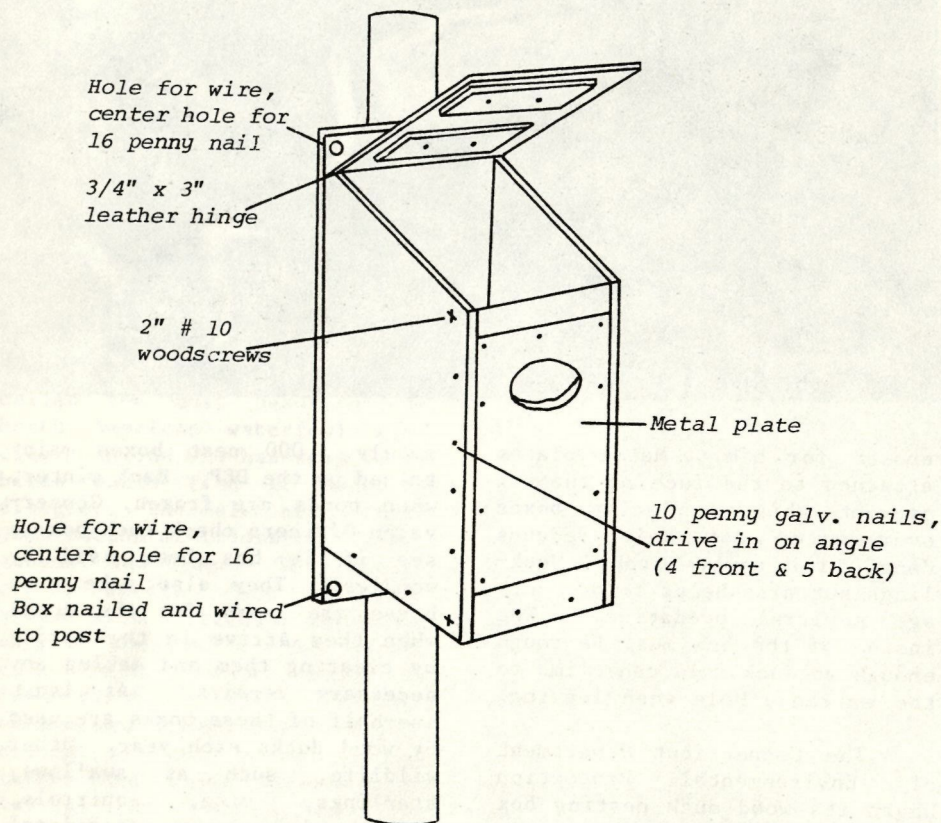
Leonard Lee Rue III photo

The DEP is not the only organization that maintains nest boxes. The Connecticut and the National Audubon Society each maintain approximately 20 boxes on their sanctuaries in Connecticut. The Connecticut Waterfowling Association has been interested in this program for a long time. The members (mostly duck hunters) currently maintain 100 wood duck boxes and are in the process of expanding their program to include another 100 boxes.

Nesting sites are only one of many needs of wood ducks. Natural cavities are so scarce, however, that nest boxes are an important way that man can contribute to their welfare. ■

How to build a wood duck nesting box

Prepared by DEP Wildlife Unit



Box

The nesting box should be made of rough, unplanned lumber (ducklings cannot climb out of boxes with a smooth interior finish), preferably one inch stock. Use all galvanized nails, toenailed into boards to prevent drawing. Galvanized screws should be used to strengthen corners of box. Make corners tight to prevent leakage. Nail drip catch board to back, 1/4 inch above cover. Use leather hinges to fasten top to back. Drill four or five 1/4 inch holes in bottom for drainage. DO NOT stain, creosote or paint! Cover bottom with no more than three inches of clean pine shavings.

Poles

Cedar or other durable poles, about four to six inches in diameter, should be driven firmly into the marsh bottom. The poles should project six to eight feet above water level. Suitable lengths of two inch pipe or metal sign posts may also be used. This job is most easily done when the marsh or pond surface is frozen.

Erection

Place box on pole so that top is at least five to six feet above water. Nail back of box to pole using 16-penny spikes at top and bottom. Pre-drill small lead holes for the spikes to avoid splitting the board. Wire

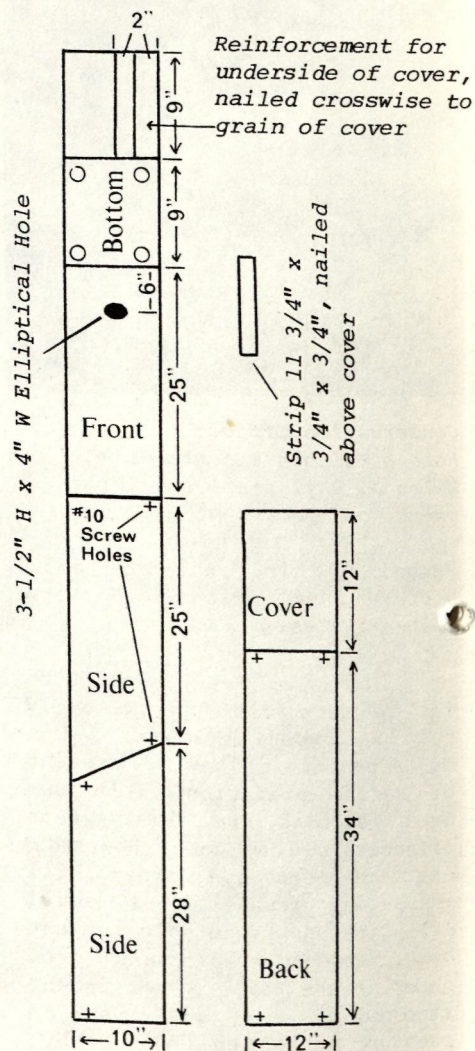
Materials for box

ROUGH LUMBER

One board, 3' 10" x 12" x 1"
One board, 8' 0" x 10" x 1"
Strip, 12" x 3/4" x 3/4"

HARDWARE

33 Galvanized nails
8 Woodscrews
2 3/4" x 3" leather hinges
4 1" roofing nails to fasten hinges
4 1-1/2" nails to hold reinforcement strips to underside of cover
2 6" pcs. soft wire to hold cover



box securely to pole with soft #9 wire, running wire through holes and winding it around a nail driven in the back side of the pole. If pipe is used, attach box with two u-bolts. Use 3-1/2 x 3/8 inch hex head machine bolts with large washers against box when using sign posts. Boxes and poles should be placed during the winter when there is ice. The poles can be driven through holes chopped in the ice while the frozen surface provides a stable footing. Materials can be carried across the ice more easily than they can be transported by boat. Make sure the ice is neither thin nor "rotten."

Recommendations

1. Boxes should be located on ponds that have marshy borders. They will be of greatest benefit in areas where large trees with natural nesting cavities are absent or limited in number.
2. Boxes should be located so that there will be water under them during nesting season. Place them above expected high water level.

3. Erect only a few boxes on a pond at first and increase the number later if usage is good. Place them at least 50 yards apart.
4. Boxes should be erected not later than March 15 for use in that year.
5. Rough lumber should be used in constructing boxes. If dressed lumber is used, tack a "ladder" of 1/4 inch mesh hardware cloth between box bottom and entrance hole to allow ducklings to climb out.
6. Trap snapping turtles, if they are abundant where boxes are placed.
7. Boxes should be inspected each winter and repairs made, debris cleaned out, and shavings replaced.
8. To prevent raccoons from opening top, use galvanized roofing nails at front corners of cover and box and fasten with soft wire.

If records are kept on number and location of boxes and usage by wood ducks, the Wildlife Unit would appreciate receiving this information. ■

Horse site pollution From page 21

The District is preparing for publication in the spring of 1982 a pamphlet entitled The Land, The Water, and Your Horse, which will be part of a program of information and education designed to help the horse owner know more about the environmental impact of large horse populations. The pamphlet will also explain applicable public health codes and environmental laws and will describe the role of the District in helping the horse owner attain best management practices and achieve regulatory compliance.

The District plans to distribute the pamphlet through horse associations, feed stores, municipal offices, environmental enforcement agencies, conservation agencies, public health officials, county fairs, environmental conservation societies, and the District offices, and on visits to horse owners made by Supervisors and others.

Recommendations

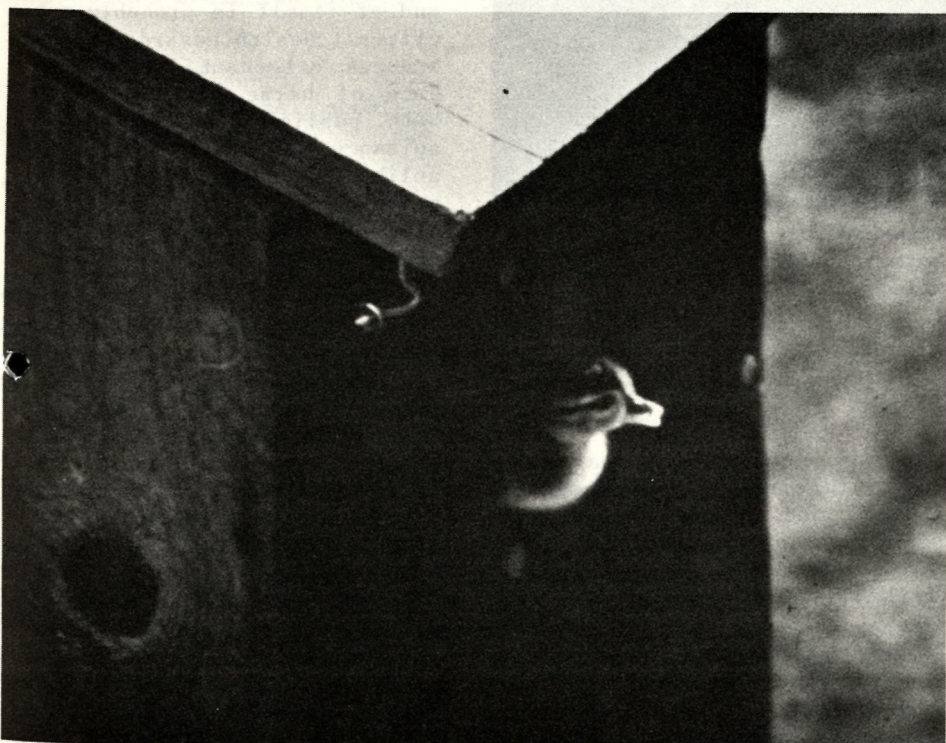
Although matters of priority have been identified and a plan of action begun, this study of horse-related pollution can only be considered as preliminary and limited. There yet needs to be research and investigation into the biological, chemical, and physical characteristics of horse wastes; design of manure storage systems specifically for horse wastes; adaptation of existing erosion and sediment control practices for the horse site; and continuing assessment of the horse's impact on the environment. ■

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Fishing at reservoirs

Four Bridgeport Hydraulic Company public water supply reservoirs are again open to anglers on a company-issued permit basis during the 1982 fishing season.

Fishing will be permitted at the Saugatuck, West Pequonnock, Shelton No. 2, and Far Mill reservoirs. Permits/regulations are available at any BHC business office and town halls in Monroe, Newtown, Redding, Trumbull, and Wilton. ■



Duckling prepares to leave nesting box.

Is your horse hazardous to the environment?

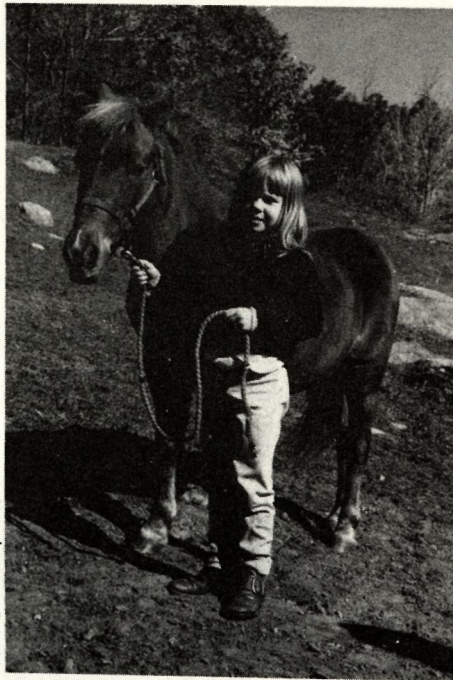
By Karl Decker,

Supervisor, Fairfield County Soil and Water Conservation District

Section 208 (Water Quality Management) of the Water Pollution Control Act prompts County Soil and Water Conservation District involvement in developing programs to implement erosion and sediment controls and to manage animal wastes associated with agriculture and farming. As part of the Fairfield County Soil and Water Conservation District's Annual Work Plan for 1981-82 the District assumed "an active role in promoting good horse management as it may impact soil and water quality resources."

Earlier, in 1979, the District had begun work in this area. Exploratory meetings were held with members of horse owners' associations, Soil Conservation Service personnel, public water supply representatives, and others to discuss the environmental impact of horses in Fairfield County.

The horse population in Fairfield County is unusually high. While a state-wide horse census is currently being made by the Connecticut Horse Council, Inc., best estimates suggest there could be anywhere from 8,000 to 10,000 horses in Fairfield. (Connecticut horse-owners claim there are some 65,000 horses in the State, making the horse population in Connecticut--13 per square mile--the most dense in the United States.) Fairfield County's affluence allows support for horses for individual and



Karl Decker photo

It's estimated Connecticut has a horse population of 13 per square mile.

family recreation, for show and competition, for polo and breeding. The number used as work animals on farms is negligible.

Aware of the unusual density of Fairfield's horse population, and concerned about the environmental impact of this large animal population, in June 1981 the District assigned the author the tasks of: (1) making a more precise assessment of the environmental impact of the horse; and (2) recommending an appropriate program of action in a report to the Board of Supervisors.

Research work included site visits to some 20 randomly selected residential and commercial sites, contact with municipal sanitarians, zoning officials, environmental enforcement officers, Soil Conservation Service, DEP, U.S. Department of Agriculture, and university personnel as well as horse owners, stable operators, public water supply officials, and others.

Manure storage and disposal

Except in very specific circumstances, horse manure in and of itself is probably not a critical health hazard. Circumstances attendant to the presence of horse wastes can pose both public health and public nuisance situations, but it is unlikely that horse manure presents health problems typical of, say, improperly controlled human sewage.

Nevertheless, to encourage and effect good wastes management and to mitigate or prevent the possibility of pathogenic intrusion into the soil and water environments, public health regulations require, and farm bureaus and the Cooperative Extension Services suggest, storage specifications, certain maintenance practices, and regular use of or disposal procedures for horse manure.

The Connecticut State Public Health Code speaks specifically to storage and disposal of manure; as a matter of regulatory convenience towns in

Fairfield County have adopted the state code in local regulations. Public health officials may require by law, for example, that manure be covered, stored in water-tight pits, and disposed of weekly from May through September. Watershed sanitation regulations prohibit accumulation of manure within specified proximities of reservoirs, watercourses, wetlands, and watersheds.

It seems likely, however, that the major problem caused by horse wastes is something else. Simply, it is that horse wastes are environmental contaminants in that the wastes are a source of nutrient pollutants and, as such, can enter wetlands, watercourses, ponds, and ground-water through runoff thereby altering or damaging the environment by "overfertilizing" the affected wetlands and watercourses.

Because of the unusually large number of horses in Fairfield County, the impact of this nutrient pollution is probably very significant. Private water company officials identify nutrient pollution as a major concern and have in their employ watershed engineers working in the field with horse owners to stop such pollution at its source.

Most residential horse owners report minimal problems with manure disposal. They report, "Friends pick it up. . ." or "I compost it. . . or use it." From on-site observations, however, there appeared to be little if any evidence of this really happening on other than a casual scale, and therefore virtually no compliance with Public Health Code Regulations concerning manure storage and disposal. Commercial and club stable operators, by and large, have contracts for the regular removal of their large volumes of manure which are, reportedly, ". . . sent off to the big mushroom growers. . ." Nonetheless, one large riding stable visited has used manure as landfill for years; another just had "a big pile out back. . ." which "gets moved around when there are complaints."

Home gardeners tend not to rely on horse manure as fertilizer. Commercial fertilizers are easier to obtain, store, and use. Their chemical composition is specified and constant. They contain no weed seeds. For the home gardener, some quantities of manure are more valuable perhaps as a chief activator in compost piles. The horse owner may well use his own manure on the family garden, too, but to spread it on pasture land requires machinery as well as the acreage. Few residential horse sites in Fairfield County have either.

Erosion, runoff, and sedimentation

Associated with the problem of manure as a pollutant are the physical problems of runoff and subsequent erosion and sedimentation from properties on which horses are maintained. There appear to be three major horse-related land uses subject to erosion: horse lots (riding rings, corrals, paddocks); bridle trails; and grazing pastures. At some public and semi-public stables there is erosion or erosion potential in parking areas and drives. At each site visited there was at least some evidence of soil erosion. Some situations were easily-remedied minor conditions of consequence only to the property owner.

But other sites showed varying degrees of soil erosion, frequently resulting in sedimentation of nearby wetlands, loss of soil, and flow of sediment into ponds and watercourses. (Additionally, there were some sites experiencing soil loss from large outdoor rings by wind--a condition probably more annoying than environmentally significant.)

One stable owner's driveway and public parking area was "regularly eroded" by rainwater rushing down bridle trails leading upslope from the stables. Another horse owner showed fist-sized rocks washed into a state highway following rains running off a pasture slope. At another site the operator reported his holding paddocks used to be "all grassed over" where now 22 horses stood

fetlock deep in mud after a summer rain. The ensuing downslope runoff at this site had caused sedimentation in a neighboring dug-well water supply.

In attempting to define the environmental impact of a horse site, one might best make a comparison with a building lot in a state of construction. Because of the extensive land disturbance on a construction site, builders and developers as a matter of course or regulation employ very specific erosion and sedimentation controls. Such may well not be the case on land where horses are kept--where the land is under continual stress.

A farmer commented, "Every time a horse puts his shod hoof down, it's like someone coming down real hard on the land with a spade or a hoe. . ." Consequently, the horse site becomes a permanent rather than temporary source of sediment generation unless safeguards are taken or controls installed. By comparison, the building lot gets seeded, landscaped, stabilized, and maintained--often as conditions of granting construction, zoning, or design permits.

Conclusions

The erosion of soil or the presence of manure on a single horse site may not contribute significantly to the pollution of nearby waters, but with many horse sites concentrated in localized or confined land areas, and given the very large horse population in Fairfield county, plus observations noted in this report, it is reasonable to conclude that such sedimentation and pollution probably has a deleterious effect on the waters, wetlands, groundwaters, and aquifers.

While certainly the combined effects of handling horse wastes and soil erosion are serious, public and private professionals tend to believe that of the two, the erosion-sedimentation problem is currently the more serious--particularly because horse sites are sites of continual and severe land stress.

CAM review From page 10

ties on specific dates unless the they are recreated by law. "Sunset" began in Connecticut as part of the 1977 reorganization of State government and is found in Chapter 28 of the Connecticut General Statutes. The Connecticut CAM Program's scheduled date of termination is June 30, 1983. During the coming weeks, the Program Review Committee will evaluate the CAM Program and report its findings to the Connecticut General Assembly. Among other issues, the Committee will determine whether the public could be adequately protected by another type of program, and whether terminating the CAM Program would "significantly endanger the public health, safety or welfare." The Committee is considering a variety of techniques to gather necessary information about CAM and survey questionnaires and public hearings are among them. The Connecticut CAM Program encourages local citizen participation in both the "Sunset" and the "312" public hearings. Please call the CAM office at 566-7404 for further information. ■

On the waterfront From page 15

encourages would-be applicants to contact him (DEP's Parks and Recreation Office, 165 Capitol Avenue, Hartford, CT 06115; (203) 566-2304). He ordinarily holds additional swim tests outdoors in June and may fill last-minute vacancies at some parks up to as late as July 15.

Truscinski lists off the selling points for signing on as a State lifeguard: guards, he says, "find their work fun, rewarding. . . they like working with people. . . like the chance to work out every day. . . enjoy being at the beach. . . feel good about protecting people. And at the end of the summer you have a good tan." ■

Permits Issued

Water Compliance

1/19/82: Newbury Crossing Condominium Association, Brookfield To discharge 9,900 gallons per day of domestic sewage to ground-

waters in the watershed of the Still River. Conditions.

1/21/82: Arbor Acres Farms, Inc., Glastonbury To discharge 1,000 gallons per day of poultry cage cleaning wastes to the City of Hartford sewerage system. Conditions.

1/26/82: John Russo, Trustee, c/o Russo Brothers, Inc., Hartford To discharge wastewaters from dredging operations to groundwaters in the watershed of the Connecticut River in an average daily flow of 720,000 gallons per day. Conditions.

1/26/82: Simkins Industries, Inc., New Haven Board Division, New Haven To discharge non-contact cooling water to the Mill River in an average daily flow of 200,000 gallons per day. Conditions.

1/26/82: Gulf Oil Corporation, New Haven To discharge stormwater from a petroleum marketing terminal operation to New Haven Harbor. Conditions.

1/26/82: National Eastern Corporation, Plainville To discharge treated brass pickling, drawing and cleaning wastewater and cooling water to the Pequabuck River in an average daily flow of 24,640 gallons per day. Conditions.

1/26/82: The Dural Company, Hamden To discharge 2 gallons per day of tumbling wastewater to the Town of Hamden sewerage system. Conditions.

1/26/82: Colt Industries, Pratt and Whitney Machine Tool Division, West Hartford To discharge treated oily wastewaters to the Town of West Hartford sewerage system in an average flow of 3,000 gallons per week. Conditions.

2/4/82: All-Brite Car Wash, Stratford To discharge an average of 2500 gallons per day of automobile washwaters to the City of Stratford Sewerage System. Conditions.

2/4/82: Cooke's Equipment Co., Inc., Wallingford

To discharge steam cleaning and vehicle washing wastewaters to the Town of Wallingford Sewerage System in an average daily flow of 60 gallons per day. Conditions.

2/4/82: Town of Columbia To operate and maintain a sanitary landfill with the resultant leachate discharged to the groundwaters of the state. Conditions.

2/4/82: Syn-Lube Corporation, Southport To discharge 5 gallons per day of floor washdown to the Town of Fairfield Sewerage System. Conditions.

2/4/82: Della Construction Co., Inc., Enfield To discharge 750 gallons per day of steam cleaning and wash water to the sanitary sewers in the Town of Enfield. Conditions.

2/4/82: Linatex Corporation of America, Stafford Springs To discharge pretreated rubber surface preparation wastewater to the Town of Stafford Springs Sewerage System in an average daily flow of 300 gallons per day. Conditions.

2/4/82: Becton-Dickinson & Co., Inc., Canaan To discharge to Robbins Swamp an average daily flow of 60,500 gallons per day of wastewaters. Conditions.

2/4/82: H. Krevit & Co., Inc., New Haven To discharge 50 gallons per day of neutralized acid rinsewater to the City of New Haven Sewerage System. Conditions.

2/4/82: Gallagher Buick, Inc., New Britain To discharge 800 gallons a day car wash water to the City of New Britain wastewater treatment facility. Conditions.

2/16/82: Quantum Incorporated, Wallingford To discharge non-contact cooling water to the Quinnipiac River in an average daily flow of 66,435 gallons per day. Conditions.

2/19/82: Consolidated Industries, Inc., Cheshire To discharge 400 gallons per day of non-destructive testing rinse-

water to the Town of Cheshire Sewerage System. Conditions.

2/23/82: Crowninshield Corporation, Peabody, Massachusetts To discharge 18,700 gallons per day of sanitary sewage to the Mattabassett District Sanitary Sewerage System in the City of New Britain. Conditions.

2/24/82: Department of Energy, Schenectady Naval Reactors Office To discharge to an unnamed tributary to the Farmington River an average daily flow of 147,200 gallons per day of wastewaters. Conditions.

2/24/82: Colchester Water Department To discharge to Cabin Brook an average daily flow of 72,000 gallons per day of contaminated groundwater. Conditions.

2/24/82: Guy's Automotive Specialties, Bridgeport, To discharge 100 gallons per day of automotive washwater and floor washdown to the City of Bridgeport Sewerage System. Conditions.

2/24/82: Culbro Land Resources, Inc., Windsor To discharge 10,020 gallons per day of treated domestic sewage to the groundwaters in the watershed of the Farmington River. Conditions.

3/4/82: Olin Ski Company, Middletown To discharge non-contact cooling water to Sawmill Brook. Conditions.

3/4/82: Attorney Jeffrey P. Ossen, Mansfield Center To discharge domestic sanitary wastewaters to the City of Meriden Sewerage System in an average daily flow of 9,230 gallons per day. Conditions.

3/4/82: The Barnes Group, Inc., Associated Spring Division, Bristol To discharge to Ivy Brook an average daily flow of 155,000 gallons per day of wastewaters. Conditions.

3/4/82: Pratt-Read Corporation, Ivoryton To discharge to the Falls River an average daily flow of 9,000 gallons per day of effluent. Conditions.

3/4/82: Allegheny Ludlum Steel, Wallingford Plant, Wallingford To discharge to the Quinnipiac River an average daily flow of 1,883,000 gallons per day of wastewaters. Conditions.

3/4/82: Town of Windham, Willimantic To discharge 3,200 gallons per day of tipping floor washdown, ash quench and steam production wastewaters to the Town of Windham Sewerage System. Conditions.

3/4/82: John Warren, Windsor To discharge 12,400 gallons per day of heat pump discharge water to the Farmington River watershed. Conditions.

3/4/82: Quantum Incorporated, Wallingford, To discharge 200 gallons per month of wastewaters generated from alkaline cleaning and deionized water rinsing of stainless steel parts to the Town of Wallingford sewerage system. Conditions.

3/5/82: Sinclair & Valentine, Des Moines, Iowa To discharge non-contact cooling water to an Unnamed tributary to the Hockanum River in Manchester in an average daily flow of 24,500 gallons per day. Conditions.

3/15/82: AMF Cuno Division, AMF Incorporated, Stafford Springs To discharge pretreated wastewater from fiber filter manufacturing operations to the Town of Stafford Sewerage System in an average daily flow of 200,000 gallons per day. Conditions.

3/15/82: The B.J. Tool Company, Terryville To discharge to the Pequabuck River an average daily flow of 670 gallons per day of wastewaters. Conditions.

3/15/82: A. J. Tuck Company, Brookfield To discharge treated metal finishing wastewaters to the Still River in an average daily flow of 3,400 gallons per day. Conditions.

3/15/82: Pape Electroplating Incorporated, New Britain To discharge metal finishing and cleaning wastewaters to the City of New Britain Sewerage System in an average daily flow of

46,800 gallons per day. Conditions.

3/15/82: Kement & Son Construction, Inc., and Stanley J. and Isabella Kement, Broad Brook To discharge 12,000 gallons of contaminated groundwater to the East Windsor Warehouse Point Water Pollution Control Facility. Conditions.

3/15/82: Marlborough Manor, Inc., Marlborough To discharge 8,000 gallons per day of treated domestic sewage to the Town of Marlborough groundwaters. Conditions.

3/15/82: Sarat Manufacturing Company, East Hartford To discharge treated cleaning and pickling wastewaters to the Metropolitan District Sanitary Sewerage System in an average daily flow of 1040 gallons per day. Conditions.

3/15/82: Microtech, Inc., Cheshire To discharge to the groundwaters of the Town of Cheshire an average daily flow of 6,000 gallons per day of wastewaters. Conditions.

3/15/82: Curtiss-Ryan Lincoln Mercury, Inc., Shelton To discharge 100 gallons per day of vehicle wastewater and vehicle drippage to the Town of Shelton sewerage system. Conditions.

3/15/82: Whitney Chain Operations, Dresser Industries, Inc., Hartford To discharge vibratory finishing and washing wastewater to the Metropolitan District Sewerage System in an average daily flow of 2,850 gallons per day. Conditions.

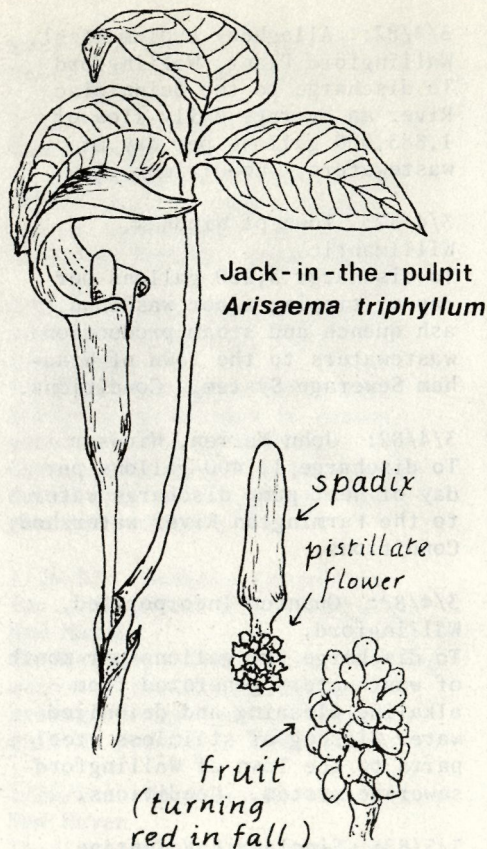
3/15/82: Pfizer, Inc., Groton To operate a landfill site for the disposal of 7,515 tons per year of filter aid and powerhouse soot with the resultant leachate discharged to the groundwaters in the watershed of the Thames River. Conditions.

3/19/82: Polycast Technology Corporation, Stamford To discharge floor washdown from the casting area to the City of Stamford sewerage system in an average daily flow of 1,000 gallons per day. Conditions.

One of the joys of spring is the appearance of a delightful array of lovely woodland flowers. Jack-in-the-pulpit is one of the more familiar of these early flowers. It is usually found blooming in moist woods from the middle of May to early June and is easily recognized because of its unusual appearance.

This handsome plant typically has one or two leaves, each divided into three large leaflets, and a conspicuous flower with a hood-like spathe (the pulpit) and a finger-like spadix (Jack). The spathe may vary in appearance from green to green and white-striped to purplish brown. This has led to confusion as to whether there are variations in one species or three separate species.

The sexes in Arisaema triphyllum are usually separate, only occasionally are both male and female organs found on the same plant. The male flowers



with their creamy white or purple-tipped stamens form the base of the spadix. The round green female flowers are located on separate plants on the same section of the spadix. Cross pollination is carried out by beetles and small fungus gnats.

Jack-in-the-pulpit is an annual and dies back in the fall. The male plant bears fewer leaves than the female, which is usually larger, needing more energy to produce the short, red, corn-cob-like fruit. The sex of the individual plant is determined anew each year depending on growing conditions. Its size will determine whether it is to be male or female.

Jack-in-the-pulpit is sometimes called Indian turnip because of the corm, or underground stem, which persists through the winter. Although dangerous to eat when raw, this part of the plant was cooked by the Indians who used it as a vegetable.

DEP Citizens' Bulletin

State of Connecticut
Department of Environmental Protection
State Office Building
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